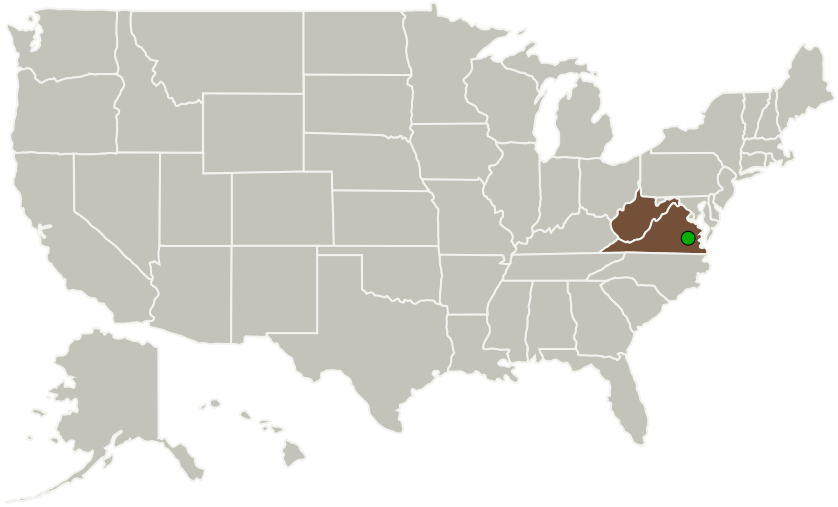
Metal Matrix Composite Enchanced Aluminum Structures, Phase I

Completed Technology Project (2016 - 2016)

Project Introduction

The proposed research pursues a path for reducing structural weight, increasing structural performance, and reducing fabrication cost while also minimizing maintainability. The approach, which is based on selective reinforcement, is a change in the basic design philosophy and will result in the development of a hybrid material form. The selective reinforcement approach allows the structural design requirements to define the material form. This method is the reverse of the typical development flow path used for building structures. This backward path results in more efficient material forms that are of greater value to structural engineers. Specifically, the proposed effort will combine a metal matrix composite (MMC) prepreg tape with an ultrasonic additive manufacturing process. The combination of these technologies will lead to enhanced lightweight, cost-effective metallic structures with shielding and thermal management built in.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Touchstone Research Laboratory, Ltd.	Lead Organization	Industry	Triadelphia, West Virginia
Langley Research Center(LaRC)	Supporting Organization	NASA Center	Hampton, Virginia

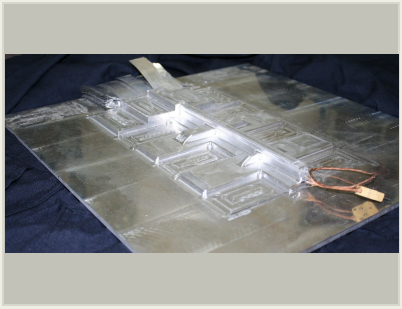


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Table of Contents

Small Business Innovation Research/Small Business Tech Transfer

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Completed Technology Project (2016 - 2016)

Primary U.S. Work Locations	
Virginia	West Virginia

Project Transitions

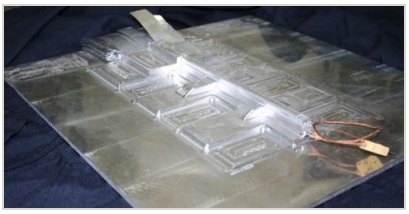
June 2016: Project Start

December 2016: Closed out

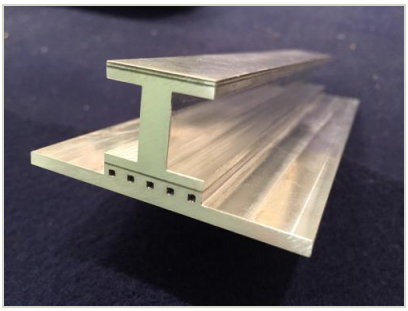
Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/139882)*

Images



Briefing Chart Image
Metal Matrix Composite Enchanced Aluminum Structures, Phase I
(https://techport.nasa.gov/image/136786)



Final Summary Chart Image
Metal Matrix Composite Enchanced Aluminum Structures, Phase I Project Image
(https://techport.nasa.gov/image/131523)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Touchstone Research Laboratory, Ltd.

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

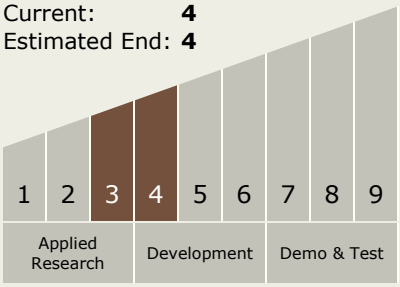
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Brian L Gordon

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



Metal Matrix Composite Enchanced Aluminum Structures, Phase I

Completed Technology Project (2016 - 2016)

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.4 Manufacturing
    - TX12.4.1 Manufacturing Processes

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System